

cal inventions of later and more intellectual ages, when the victory of truth over error replaced that of day over night in the language of the initiated. We must come down to the classic age of the XIX dynasty before this spiritualizing process of the poets of the priesthood becomes well authenticated.

The connection of Ormuzd, Horus and the Shemitic *aur*, light, is evident; but the relationships of *lux*, *fax*, and *ox* (oculus, $\omega\zeta$) and of *lux* with $\beta\epsilon\tau\nu$, *ruere*, and of *fax* with $\text{Iax}\chi\omicron\varsigma$ will also repay an effort at development.

The President reported that he had received a letter from Drexel, Harjes & Co., of Paris, advising that the sheet allowed for the receipts of interest on the 3 per cent. French Rentes, belonging to the Michaux Legacy had been filled up. The rules of the French Treasury require that a new sheet and inscription shall be made in the name of the Society. They forwarded the proper petition to the Minister of Finance for that purpose which has been duly signed by the President and Treasurer in the presence of the French Vice-Consul at Philadelphia, and the same duly and officially certified by him as required by the laws of France, and such petition has been sent to Messrs. Drexel, Harjes & Co., at Paris.

And the meeting was adjourned.

Notes on the Cumberland or Potomac Coal Basin. By Howard Grant Jones, M. S.

(Read before the American Philosophical Society, September 17, 1880.)

This field is a long triangular territory of about sixty miles in length, lying along the outside or eastern edge of the great Alleghany uplift, and is situated in Somerset county of Pennsylvania, Alleghany county, Maryland, and Mineral county, West Virginia. Although considered a spur, the basin is rather an overlapping of the Coal strata to the eastward of the Alleghanian fold which demarcates the celebrated Coal fields of those States. It is with Broad Top and an unexplored basin in Alleghany county (New River) the only deposits beyond this line. On leaving Pennsylvania this persistent anticlinal becomes "Savage Mountains," which bend south west towards a geological center at Union, in Maryland, where are pinned together the southern extremities of the several basins of Maryland and Pennsylvania lying parallel to the Alleghanies. The Coal strata here flow over Savage mountain into the Potomac basin, virtually terminating this range in the general elevation. The name and bold characteristics of

the Alleghanies are here, however, taken up by a range of mountain fifteen miles to the eastward, forming the border of the field (Davis mountain of Maryland, and Front ridge of Virginia). Union is a point situated on the great swell or uplift in northern West Virginia pointed out by Professor Rogers.

The rocks of Savage mountain are composed of the Mauch Chunk Red Shales and Limestones (XI) and the overlying Conglomerate (XII). They fold under the field with a dip of from 10' to 20', and rise up again in Davis mountain, five miles beyond, with a reverse dip considerably strengthened. There is a line of upthrow lying east of the basin, running along the outlying red shale valley, composed of the lower limestones, the flint and the hard sandstones of X and IX (Pocono and Catskill).

Wells' Creek mountain at the northern end of the basin, is flanked by the uplifted Pocono sandstone and crowned by the same, as it returns and dips down the east flank, on its way under the town of Cumberland. It carries here on its back the overlying slates and flints, iron ore and lime strata of XI. A range of little mounds dotted along between the basin and this mountain range shows the harder limestones on edge. In Wells' Pass, under the curve or anticlinal of the Pocono sandstone, is to be seen the red sandstone of IX, though quickly returning.

Knobby range, further to the south, towards Piedmont, probably carries the Great White Sand (X), since at Keyser we find the lower limestones of the red shales and the underlying flints upturning east of the town and the New Creek ridge, and just west of the range. The Mauch Chunk shales (XI) show on the Potomac, near Keyser, dipping 45° to the north-west.

The accompanying section has been made at different points on George's creek, from Barton to Piedmont and on Potomac to Keyser. It includes the Coal Measures, from a seam 400 feet below the Pittsburg Coal; possibly the Conglomerate Series; the duplicate beds of red shale and limestones to the Great White or Pocono sandstone. The intervene strata to the Great Bed has already been published in Tyson Section, Plate VI, Report HHH.* The Lower Barren group of coals are here distinctly shown with their fossil limestones and sandstones, down to the Mahoning SS. Founded on the existence of the underlying Ferriferous limestone at Stony river, Prof. J. P. Lesley some time ago identified the Upper Bloomington or six feet coal of this basin as the lower Kittaning seam. This is now proved by the discovery of the fire-clay and limestones on the Baltimore and Ohio R. R., and the lower iron and clay deposits to the Piedmont SS.

The unveiling of the Conglomerate series of sandstones is important, showing a total thickness of 560 feet, from the Piedmont sandstone down to the lowest bed of coal. This series has its coal deposits through its entire thickness, though not largely developed. But at least one workable large seam has been noted, but has been omitted because of the uncertainty of its proper position.

* Report of Progress of Second Geological Survey of Pennsylvania, Somerset county, by F. & W. C. Platt.

The existence of a green shale and sandstone deposit of 200 feet, underlying the Conglomerate series and carrying an undeniable print of its relation to the Mauch Chunk shale in the red-hued earth topping it.

The most noticeable feature is the doubling of the red shale and limestone deposit of XI. There are two distinct series, under no condition possibly to be confounded or misidentified. The upper of 375 feet, red shale and black (fossil), red and gray limestone of 200 feet underlying; the lower of 2000 feet red strata and 450 feet gray limestone. Both series being fossiliferous in the upper part.

Another feature is the shale, flint and iron ore deposit, 300 feet, underlying the foregoing groups and separated from the red rocks of IX by the only heavy sandstone (Pocono SS.) at this horizon. It is a pure, hard, solid white rock.

Section of strata from Lower Barren Measure to Pocono Sandstone, as found on George's Creek and the Potomac River, Western Maryland and Virginia, June, 1880.

- 24' Sandstone. See base of Prof. Tyson's Section, Plate VI, Report H. H. H., Second Geological Survey, Penna. The strata from this sandstone to the Pittsburg seam and higher are there given.
- 39' Shale. Lower three feet contains Neuropteris, Calamites, Pecopteris. 6" Slate Bland fine gr., containing Neuropteris angustifolia, Loschii and tenuifolia.
- 3' 3" Coal. *Hampshire Seam.*, probably same as Coleman bed of Somerset Co., Pa. It is 3' 3" at Barton, 4' 10" near Piedmont, 5' on Savage river near Bloomington, 3' 10" on Sharpless Hill, ten miles to the southward. It is probably the "Rock Coal" of Millersburg, Pa. It is characterized by bottom slate, shale roof, salmon-colored ash from lower bed, and ferns. It is the most widely known bed in the basin except the Six foot (Kitt.). It is 388 feet below Pittsburg seam, Barton; 4' 10" at Moore's run, 347 feet Hampshire Co., Virginia, workings near Piedmont. It runs from 2.5% ash at bottom to 15% ash at top of bed; and sulphur in same relations from .57% to 1.75%.
- 10' Fire-clay containing more or less balls of iron. Blue color.
- 6' Limestone.
- 15' Sandstone.
- 12' Shale.
- 10' Sandstone.
- 3' 2" Coal. *Bartlett's Run seam.*
- 10' Black slate.
- 6' Shale.
- 4' 9" Fire-clay. Impure.
- 9' 9" Sandstone.
- 9' Gray shale.
- 6' 2" Marius shale. One foot fossiliferous limestone at top.
- 4" Coal.

- 5' 5'' Sandstone.
 5' 2'' Shale.
 1' 6'' Coal.
 1' 4'' Shale.
 5' Fire-clay.
 5' " sandy.
- 50' *Sandstone pebbled. Mahoning S. S.?* Not identified north of Frostburg. At Barton and below it is a hard, fine-grain half-bedded pebbled rock of 40 feet. At Crooked run, 12 miles south of Piedmont, it is fully pebbled. On Stony river, further south yet, it is simply a mass of agglutinated pebbles of 60 feet.
- 5' Shale.
 1' 10'' Coal.
- 20' Shale, with limestone at bottom.
 6' Shale.
 4' Sandstone.
 4' Iron ore, clayey.
 5' Fire-clay. Free from balls of iron and plastic.
 5' Coal. Bear's Hollow Coal, Morrison's seam. Near Barton it is 3' 4''. At Bloomington it is 5', at Piedmont 5' 6'', and at Sharpless' Hill 5' 2'', and further south much thicker. It is characterized by hard nature of the coal and its fire-clay roof and floor. Contains little pyrites and yields 5% of ash, gray. It runs about 40' under the Mahoning pebble rock above and 175' over the Upper Bloomington seam (Kittanning). It runs 200' to 220' under the Hampshire Coal, at the head of section.
- 10' Fire-clay.
 10' Sandstone.
 20' Shales.
 2' 8'' Coal.
 2' Clay.
 15' Sandy shale.
 1' Coal.
- 10' Fire-clay and shale. Fire-clay and shale containing iron ore in center of bed.
 10'* Hard sandstone. Reddish color.
 10' Black slate.
 3' Sandstone.
 30' Shale. Containing marine shells and a reputed coal.
 40' Sandstone.
 10' Shale and black slate.
 5' 6'' Coal. Upper Bloomington seam. Kittanning Lower Coal. It is probably the "Savage" seam of Millersburg. At Piedmont it is 5' 6''; at Bloomington, 5'; McCorbin's hill, 7' 2''; Rinker's hill, 8' 3''; at Falls Stony river, 9'. Characterized north of Piedmont by middle slate, calamite tufts in roof overlying sandstone and fire-clay flow. In

lower part of basin by heavy top slate and the unusual size of seam, as above. It is a bright, soft coal, yielding 7% gray ash and somewhat sulphury. It runs from 70 to 90 feet over the Piedmont sandstone, and 750 to 800 feet under the Pittsburg seam.

- 10' Clay and ore.
- 2' Sandstone.
- 8' Limestone.
- 12' Sandstone.
- 4' 10'' *Coal.*
- 5' Clay.
- 4' Shale.
- 1' Iron ore.
- 7' Shale, clay and sandstone.
- 5' Clay, pure. Fine clay bed. It is probably much thicker than this within the mountains, and resembles in appearance and quality the Mt. Savage clay bed. (See below.)
- 22' Sandstone. Sometimes found pebbled, as if indicating the approach to the conglomerates.
- 1' 8'' *Coal.*
- 10' Fire-clay.
- 30' *Sandstone. Piedmont Sandstone.*
- 4'' *Coal.*
- 41' Sandstone and shale.
- 11' Sandstone pebbled.
- 2' 6'' *Coal.*
- 12' Shale.
- 38' Sandstone.
- 2' 6'' *Coal.*
- 53' Unknown, shaly.
- 38' Sandstone.
- 42' Shale.
- 1' 10'' *Coal.*
- 5' Shale.
- 43' Quartz sandstone.
- 1' to 4' *Coal.*
- 8' Clay. Mt. Savage. It is a pure shale clay of great standing power. It thickens to 16 feet at places, and lies in rolls or pockets in a softer and semi-plastic clay lying under it. It contains but little iron or potash. It has been opened at Williams station, Somerset Co., Pa., and at Ellerslie, Pa., also near Mt. Savage, and is found cropping along the crest of the mountain on each rim of basin.
- 4'' *Slate.*
- 6'' *Coal.*
- 60'* Sandstone conglomerate, with vertical split.
- 15' Shale.
- 55' Sandstone.
- 6'' *Coal.*

- 22' Shale interval.
- 35' Sandstone.
- 20' Thin shaly sandstone.
- 1'* *Coal.*
- 5' Black slate.
- 20' Sandstone.
- 1'* *Lowest coal.*
- 14' Shale.
- 10' Red bluish shale.
- 75' Shale.
- 40' Sandstone, hard.
- 50' Green shale.
- 10' Sandstone.
- 375' Red shale.
- 40' Fossil *limestone.*
- 28' Green shale to reddish.
- 3' Red *limestone.*
- 4' Red sandstone.
- 36' Red *limestone.* Not fossiliferous.
- 160' Impure and interstratified *limestones* and sandstones.
- 30' Gray, wavy *limestone*, showing washings or waves of color in structure.
- 20' Undetermined.
- 50' Sandstone.
- 2000' Red shales.
- 440' Limestone strata, fossiliferous at top; 40 feet pure cement limestones at bottom.
- 300' Brown shale and flints, containing *iron ore beds* at base.
- 80' to 100' Pocono sandstone.

} *Upper Limestone* of the Mauch Chunk shale, same as found in Youghioghany valley, called "*Sang Kine limestone.*"

Résumé.

Lower Barren and Sub Lower Coal Measures.....		563 ft.
Conglomerate Measures.....XII.....		560 "
Green Shale and Sandstone..	}	200 "
Red Shale (Upper).....		375 "
Limestone (Upper).....	}	301 "
Gray Strata.....		70 "
Red Shale (Lower).....	}	2000 "
Limestone (Lower).....		475 "
Shale Flints and Iron ore...	}	300 "
Pocono Sandstone.....X.....		100 "
		4944 ft.